



**US Army Corps
of Engineers®**

Engineer Research and
Development Center

Service/Capability

Maneuver Support and Sustainment

Description

Maneuver Support and Sustainment (MSS) specialists at the Engineer Research and Development Center's Cold Regions Research and Engineering Laboratory (ERDC-CRREL) develop innovative solutions for challenging problems in a wide variety of environments, including temperate and extreme conditions, and remote sites such as Antarctica. MSS specialists focus on technologies to optimize vehicle mobility in developed and undeveloped terrains in all seasons; engineering principles for force projection airfields in remote, austere environments; and the sustainment of operational capabilities in remote, extreme cold regions.

Capabilities

Technological capabilities include neural networks and expert systems that model complex soil behavior and provide new methods for solving vehicle-terrain contact problems that involve the mechanics of engineering materials. ERDC-CRREL's MSS specialists also help prepare U.S. armed forces for operations in harsh environments. This necessitates understanding logistics in austere environments and their relationship to overall maneuver support. Efforts include evolving work in small-unmanned-vehicle-to-terrain interactions.



MSS specialists help prepare U.S. armed forces for operations in harsh environments.

Supporting Technology

ERDC-CRREL's MSS specialists employ unique expertise, equipment, and facilities to develop procedures and tools to meet customers' needs.

- Comprehensive geotechnical laboratories and state-of-the-art coldroom facilities
- CRREL Instrumented Vehicle
- Frost Effects Research Facility
- Materiel Evaluation Facility
- Mobility Laboratory
- Specialized instrumentation packages

Benefits

ERDC-CRREL's MSS specialists help customers mitigate risk, design efficient solutions, and expand operational capabilities, thereby ultimately saving money.



ERDC-CRREL's MSS specialists are seeking solutions to hazardous dust and blowing snow conditions affecting rotary wing operations.

Success Stories

Force Projection Airfields

- Developed solutions for rapid preflight deicing of UH-60 Black Hawk helicopter
- Upgraded standards for C-17 operations on unimproved and unpaved runways

Sustaining Operations in Remote Cold Regions

- Developed and tested a concept unmanned vehicle in Greenland as a potential logistics reach-back capability for a remote austere environment
- Developed construction methods and design requirements for sea ice, glacial ice, and deep snow airfields in Antarctica
- Mitigated crevasse hazards and deep snow mobility challenges, resulting in the successful completion of an Antarctic over-snow logistics convoy

Vehicle Mobility

- Assessed and quantified Alaskan military training lands for all-season maneuver training of the Stryker Brigade Combat Team
- Created all-season virtual proving ground of an existing site for military vehicle verification and validation
- Developed real-time vehicle simulator capability to include winter terrain
- Finite element modeling of tire/terrain/pavement interactions

ERDC POCs

Dr. Sally A. Shoop, Research Civil Engineer, Force Projection and Sustainment Branch
e-mail: Sally.A.Shoop@erdc.usace.army.mil
Telephone: 603-646-4321

Dr. Justin B. Berman, Chief, Force Projection and Sustainment Branch
e-mail: Justin.B.Berman@erdc.usace.army.mil
Telephone: 603-646-4794